

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) Carbon nanotubes, which are directly grown over a carbon substrate, whose internal and external walls are uniformly doped with nano-sized metallic catalyst particles ~~to a degree of 0.3-5 mg/cm²~~, wherein the carbon nanotubes ~~are~~ include a main axis region with a terminal portion and a first portion, wherein the terminal portion is located on the main axis region opposite from the carbon substrate and the first portion is located between the terminal portion and the carbon substrate, and wherein one or more branches branch out from the first portions to form branched carbon nanotubes.

2. (Original) The carbon nanotubes of claim 1, wherein the metallic catalyst particles are derived from at least one selected from the group consisting of Pt, Ru, Fe, Co, and alloys or mixtures of the forgoing elements.

3. (Original) The carbon nanotubes of claim 1, wherein the carbon substrate is carbon cloth or carbon paper.

4. (Previously Presented) The carbon nanotubes of claim 1, wherein the catalyst is selected to act as both a catalyst for carbon nanotube growth and as a fuel cell catalyst.

Claims 5-12 (Cancelled)

13. (Previously Presented) A fuel cell using the carbon nanotubes grown over the carbon substrate according to claim 1 for an electrode.

14. (Previously Presented) A fuel cell using the carbon nanotubes grown over the carbon substrate according to claim 2 for an electrode.

15. (Previously Presented) A fuel cell using the carbon nanotubes grown over the carbon substrate according to claim 3 for an electrode.

16. (Previously Presented) A fuel cell using the carbon nanotubes grown over the carbon substrate according to claim 4 for an electrode.

17-30. (Cancelled)

31. (New) The carbon nanotubes of claim 1, wherein the internal and external walls of the carbon nanotubes are uniformly doped with nano-sized metallic catalyst particles to a degree of $0.3\text{-}5\text{ mg/cm}^2$.

32. (New) The carbon nanotubes of claim 1, wherein the one or more branches comprise at least two branches branching out from the first portion of the carbon nanotubes.

33. (New) A branched carbon nanotube comprising:
a carbon nanotube main axis region comprising a first end portion, a second end portion, and a middle portion between the first and second end portions;
and
one or more branch regions branching out from the middle portion of the main axis region.

34. (New) The branched carbon nanotube of claim 33, wherein the one or more branched regions comprise at least two branches branching out from the middle portion of the main axis region.

35. (New) The branched carbon nanotube of claim 33, wherein internal and external walls of the branched carbon nanotubes are uniformly doped with nano-sized metallic catalyst particles.

36. (New) The branched carbon nanotube of claim 35, wherein the doping is to a degree of $0.3\text{-}5\text{ mg/cm}^2$.

37. (New) A branched carbon nanotube comprising:
a main axis portion with two or more branch portions emanating from the main axis portion.

38. (New) The branched carbon nanotube of claim 37, wherein at least one of the branch portions emanate from a non-terminal portion of the main axis portion.

39. (New) The branched carbon nanotube of claim 37, wherein internal and external walls of the branched carbon nanotube is uniformly doped with nano-sized metallic catalyst particles.

40. (New) The branched carbon nanotube of claim 39, wherein the doping is to a degree of 0.3-5 mg/cm².

41. (New) The carbon nanotube of claim 39, wherein the metallic catalyst particles are derived from at least one selected from the group consisting of Pt, Ru, Fe, Co, and alloys or mixtures of the forgoing elements.

42. (New) The carbon nanotube of claim 39, wherein the catalyst is selected to act as both a catalyst for carbon nanotube growth and as a fuel cell catalyst.